

WHAT IS CLAIMED IS:

1 pub
2 dis 1. A workflow management system for creating and delivering output
3 material, comprising:
4 generating a customer record to include fields specifying at least one product,
5 customer preferences, and a selected output method to deliver generated output
6 material on the product specified in the customer record;
7 adding a job record including a status field to a job status table for the
8 customer record;
9 setting the added job record status to a first status;
10 processing a selected job in the job status table;
11 invoking a first worker if the selected job has the first status;
12 generating, with the first worker, output material from processing the product
13 and customer preference fields in the customer record for the selected job;
14 setting the status for the selected job in the job status table to a second status
15 after generating the output material with the first worker;
16 invoking a second worker if the selected job has the second status;
17 determining, with the second worker, a selected one of a plurality of delivery
18 options from the customer record for the selected job; and
19 transmitting, with the second worker, the output material via the determined
delivery option to the customer specified in the customer record.

Sub
C1 2. The method of claim 1, wherein the first worker generates output
3 material by:
4 accessing at least one content file by processing a database table using values
5 in the customer record associated with the selected job; and
generating the content of each accessed file into the output material.

1 *July*
2 *file* 3. The method of claim 2, wherein the first worker further performs:
3 processing a template including queries of records in the database table;
4 accessing at least one value in a field in one customer record to include in a
5 query against the database table; and
6 applying the query against the second database to determine a record
7 associated with a file including fields matching the query, wherein the accessed file is
8 associated with the determined record, and wherein generating the content into the
9 output material comprises generating the content from the accessed file into the
10 template, which forms the output material.

1 4. The method of claim 1, wherein the first status is associated with the
2 first worker and the second status is associated with the second worker, wherein the
3 first and second workers further perform querying the job status table to access all
4 jobs having the status associated with the worker.

1 5. The method of claim 1, further comprising:
2 determining, with the first and second workers, whether an error occurred
3 while processing the selected job;
4 setting, with the first and second workers, the status in the job status table for
5 the selected job to an error status;
6 invoking an error worker if the selected job has the error status;
7 performing, with the error worker, error recovery operations for the selected
8 job; and
9 setting, with the error worker, the status of the selected job to one of the first
10 and second statuses after the error recovery operation.

1 6. The method of claim 1, wherein the job status table is processed by a
2 supervisor program that polls the job status table at predetermined intervals, wherein

3 the supervisor program performs the steps of invoking the first and second workers,
4 and wherein the supervisor program processes every record in the job status table
5 when performing the polling operation.

1 ^{SUP 17} 7. The method of claim 1, wherein a worker transition table includes a
2 plurality of records, each indicating an input worker, a completion state, an output
3 worker, and an output status, wherein the input worker indicates the worker assigned
4 to process the job, the completion state is a status indicated for the job after the input
5 worker processes the job, the output worker is the worker that processes the job after
6 having been processed by the input worker and resulting in the completion state, and
7 the output state is the state to which the job status in the job status table is set, and
8 wherein the job status table further indicates a current worker assigned to process the
9 job, wherein setting the status for the selected job in the job status table comprises
10 determining from the worker transition table one record having an input worker and
11 completion state matching the current worker and the job status, respectively, and
12 setting the status for the selected job to the output state and the current worker to the
13 output worker

1 8. The method of claim 7, further comprising invoking the output worker
2 after setting the job status to the output status.

1 ^{SUP 18} 9. The method of claim 7, wherein setting the status for the selected job
2 after processing the job with one worker, comprises the worker completing processing
3 the job setting the completion status to a state indicating an outcome of processing the
4 job.

1 10. The method of claim 1, further comprising:
2 setting the status to a third status after adding the job entry in the job status
3 table;
4 invoking a data conditioning worker if the job status for the selected job is the
5 third status;
6 processing, with the data conditioning worker, the customer record to
7 determine whether at least one value satisfies at least one condition;
8 taking corrective actions, with the data conditioning worker, if the data in the
9 customer record does not satisfy each condition; and
10 setting the status of the selected job to the first status if the data in the
11 customer record satisfies each condition.

1 11. The method of claim 6, further comprising an imposition worker and
2 table of contents worker, wherein the supervisor sets the job status to an imposition
3 status and table of content status, and wherein the supervisor invokes the imposition
4 and table of content workers.

1 12. The method of claim 1, further comprising:
2 generating information on the output material;
3 setting the status for the selected job in the job status table to a third status;
4 invoking an accounting worker if the job has the third status;
5 processing, with the accounting worker, the generated information on the
6 output material to determine costs of generating the output material; and
7 generating, with the accounting worker, an invoice including the determined
8 costs of the output material.

1 13. The method of claim 1, wherein there are multiple workers each
2 associated with one input status and at least one output status, wherein the status of

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

SUB
A18
(cont'd)

a

3 the job is updated to one associated output status after one worker completes
4 processing a job, wherein the output status for one worker is the input status
5 associated with one other worker, and wherein the definition of input and output
6 statuses for workers defines the workflow of the job.

1 14. A workflow management system for creating and delivering output
2 material, comprising:

3 means for generating a customer record to include fields specifying at least
4 one product, customer preferences, and a selected output method to deliver generated
5 output material on the product specified in the customer record;

6 means for adding a job record including a status field to a job status table for
7 the customer record;

8 means for setting the added job record status to a first status;

9 means for processing a selected job in the job status table;

10 means for invoking a first worker if the selected job has the first status;

11 means for generating, with the first worker, output material from processing
12 the product and customer preference fields in the customer record for the selected job;

13 means for setting the status for the selected job in the job status table to a
14 second status after generating the output material with the first worker;

15 means for invoking a second worker if the selected job has the second status;

16 means for determining, with the second worker, a selected one of a plurality of
17 delivery options from the customer record for the selected job; and

18 means for transmitting, with the second worker, the output material via the
19 determined delivery option to the customer specified in the customer record.

1 15. The system of claim 14, wherein the means, performed by the first
2 worker, for generating output material comprises:

CD
3 accessing at least one content file by processing a database table using values
4 in the customer record associated with the selected job; and
5 generating the content of each accessed file into the output material.

1 16. 7 The system of claim 15, wherein the first worker further comprises:
2 519 A19 means for processing a template including queries of records in the database
3 table;

4 means for accessing at least one value in a field in one customer record to
5 include in a query against the database table; and

6 means for applying the query against the second database to determine a
7 record associated with a file including fields matching the query, wherein the
8 accessed file is associated with the determined record, and wherein generating the
9 content into the output material comprises generating the content from the accessed
10 file into the template, which forms the output material.

1 17. The system of claim 14, wherein the first status is associated with the
2 first worker and the second status is associated with the second worker, wherein the
3 first and second workers further comprises means for querying the job status table to
4 access all jobs having the status associated with the worker.

1 18. The system of claim 14, further comprising:

2 means for determining, with the first and second workers, whether an error
3 occurred while processing the selected job;

4 means for setting, with the first and second workers, the status in the job status
5 table for the selected job to an error status;

6 means for invoking an error worker if the selected job has the error status;

7 means for performing, with the error worker, error recovery operations for the
8 selected job; and

9 means for setting, with the error worker, the status of the selected job to one of
10 the first and second statuses after the error recovery operation.

cl 1 19. The system of claim 14, wherein the job status table is processed by a
2 supervisor program that polls the job status table at predetermined intervals, wherein
3 the supervisor program includes the means for invoking the first and second workers,
4 and wherein the supervisor program further comprises means for processing every
5 record in the job status table when performing the polling operation.

1 20. The system of claim 14, wherein a worker transition table includes a
2 plurality of records, each indicating an input worker, a completion state, an output
3 worker, and an output status, wherein the input worker indicates the worker assigned
4 to process the job, the completion state is a status indicated for the job after the input
5 worker processes the job, the output worker is the worker that processes the job after
6 having been processed by the input worker and resulting in the completion state, and
7 the output state is the state to which the job status in the job status table is set, and
8 wherein the job status table further indicates a current worker assigned to process the
9 job, wherein the means for setting the status for the selected job in the job status table
10 comprises determining from the worker transition table one record having an input
11 worker and completion state matching the current worker and the job status,
12 respectively, and setting the status for the selected job to the output state and the
13 current worker to the output worker

cl 1 21. The system of claim 20, further comprising means for invoking the
2 output worker after setting the job status to the output status.

1 22. The system of claim 20, wherein the means for setting the status for
2 the selected job after processing the job with one worker, comprises the worker

3 completing processing the job setting the completion status to a state indicating an
4 outcome of processing the job.

1 23. The system of claim 14, further comprising:

2 means for setting the status to a third status after adding the job entry in the
3 job status table;

4 means for invoking a data conditioning worker if the job status for the selected
5 job is the third status;

6 means for processing, with the data conditioning worker, the customer record
7 to determine whether at least one value satisfies at least one condition;

8 means for taking corrective actions, with the data conditioning worker, if the
9 data in the customer record does not satisfy each condition; and

10 means for setting the status of the selected job to the first status if the data in
11 the customer record satisfies each condition.

1 24. The system of claim 19, further comprising an imposition worker and
2 table of contents worker, wherein the supervisor includes:

3 means for setting the job status to an imposition status and table of content
4 status; and

5 means for invoking the imposition and table of content workers.

1 25. The system of claim 14, further comprising:

2 means for generating information on the output material;

3 means for setting the status for the selected job in the job status table to a third
4 status;

5 means for invoking an accounting worker if the job has the third status;

6 means for processing, with the accounting worker, the generated information
7 on the output material to determine costs of generating the output material; and

8 means for generating, with the accounting worker, an invoice including the
9 determined costs of the output material.

CI
1 26. The system of claim 14, wherein there are multiple workers each
2 associated with one input status and at least one output status, wherein the status of
3 the job is updated to one associated output status after one worker completes
4 processing a job, wherein the output status for one worker is the input status
5 associated with one other worker, and wherein the definition of input and output
6 statuses for workers defines the workflow of the job.

1 27. An article of manufacture for use in a workflow management system
2 for creating and delivering output material, the article of manufacture comprising
3 computer readable storage media including a plurality of computer programs,
4 including a first worker and second worker, embedded therein capable of causing at
5 least one computer to perform:

1 generating a customer record to include fields specifying at least one product,
2 customer preferences, and a selected output method to deliver generated output
3 material on the product specified in the customer record;

4 adding a job record including a status field to a job status table for the
5 customer record;

6 setting the added job record status to a first status;

7 processing a selected job in the job status table;

8 invoking the first worker if the selected job has the first status;

9 generating, with the first worker, output material from processing the product
10 and customer preference fields in the customer record for the selected job;

11 setting the status for the selected job in the job status table to a second status
12 after generating the output material with the first worker;

13 invoking the second worker if the selected job has the second status;

Feb
B3

B3
Cont'd

14 determining, with the second worker, a selected one of a plurality of delivery
15 options from the customer record for the selected job; and
16 transmitting, with the second worker, the output material via the determined
17 delivery option to the customer specified in the customer record.

C

1 28. The article of manufacture of claim 27, wherein the first worker
2 generates output material by:
3 accessing at least one content file by processing a database table using values
4 in the customer record associated with the selected job; and
5 generating the content of each accessed file into the output material.

1 SUB 22 29. The article of manufacture of claim 27, wherein the first worker further
2 causes the at least one computer to perform:
3 processing a template including queries of records in the database table;
4 accessing at least one value in a field in one customer record to include in a
5 query against the database table; and
6 applying the query against the second database to determine a record
7 associated with a file including fields matching the query, wherein the accessed file is
8 associated with the determined record, and wherein generating the content into the
9 output material comprises generating the content from the accessed file into the
10 template, which forms the output material.

C

1 30. The article of manufacture of claim 27, wherein the first status is
2 associated with the first worker and the second status is associated with the second
3 worker, wherein the first and second workers further cause the at least one computer
4 to perform querying the job status table to access all jobs having the status associated
5 with the worker.

1 31. The article of manufacture of claim 27, wherein the computer
2 programs embedded in the computer useable media further includes an error worker,
3 further comprising:
4 determining, with the first and second workers, whether an error occurred
5 while processing the selected job;
6 setting, with the first and second workers, the status in the job status table for
7 the selected job to an error status;
8 invoking the error worker if the selected job has the error status;
9 performing, with the error worker, error recovery operations for the selected
10 job; and
11 setting, with the error worker, the status of the selected job to one of the first
12 and second statuses after the error recovery operation.

1 32. The article of manufacture of claim 27, wherein the computer
2 programs embedded in the computer useable media further include a supervisor
3 program, wherein the job status table is processed by the supervisor program that
4 polls the job status table at predetermined intervals, wherein the supervisor program
5 causes the at least one computer to perform invoking the first and second workers,
6 and wherein the supervisor program processes every record in the job status table
7 when performing the polling operation.

1 ^{SUB} 33. The article of manufacture of claim 27, wherein a worker transition
2 table includes a plurality of records, each indicating an input worker, a completion
3 state, an output worker, and an output status, wherein the input worker indicates the
4 worker assigned to process the job, the completion state is a status indicated for the
5 job after the input worker processes the job, the output worker is the worker that
6 processes the job after having been processed by the input worker and resulting in the
7 completion state, and the output state is the state to which the job status in the job

C1
8 status table is set, and wherein the job status table further indicates a current worker
9 assigned to process the job, wherein setting the status for the selected job in the job
10 status table comprises determining from the worker transition table one record having
11 an input worker and completion state matching the current worker and the job status,
12 respectively, and setting the status for the selected job to the output state and the
13 current worker to the output worker.

1 34. The article of manufacture of claim 33, further comprising invoking
2 the output worker after setting the job status to the output status.

SUB
x26
35.7
2 the selected job after processing the job with one worker comprises the worker
3 completing processing the job setting the completion status to a state indicating an
4 outcome of processing the job.

1 36. The article of manufacture of claim 27, wherein the computer
2 programs embedded in the computer useable media further includes a data
3 conditioning worker, further comprising:
4 setting the status to a third status after adding the job entry in the job status
5 table;
6 invoking a data conditioning worker if the job status for the selected job is the
7 third status;
8 processing, with the data conditioning worker, the customer record to
9 determine whether at least one value satisfies at least one condition;
10 taking corrective actions, with the data conditioning worker, if the data in the
11 customer record does not satisfy each condition; and
12 setting the status of the selected job to the first status if the data in the
13 customer record satisfies each condition.

Sub
A26
Cont'd

1 37. The article of manufacture of claim 32, wherein the computer
2 programs embedded in the computer useable media further include an imposition
3 worker and table of contents worker, wherein the supervisor sets the job status to an
4 imposition status and table of content status, and wherein the supervisor invokes the
5 imposition and table of content workers.

1 38. The article of manufacture of claim 27, further comprising:
2 generating information on the output material;
3 setting the status for the selected job in the job status table to a third status;
4 invoking an accounting worker if the job has the third status;
5 processing, with the accounting worker, the generated information on the
6 output material to determine costs of generating the output material; and
7 generating, with the accounting worker, an invoice including the determined
8 costs of the output material.

1 39. The article of manufacture of claim 27, wherein there are multiple
2 workers each associated with one input status and at least one output status, wherein
3 the status of the job is updated to one associated output status after one worker
4 completes processing a job, wherein the output status for one worker is the input
5 status associated with one other worker, and wherein the definition of input and
6 output statuses for workers defines the workflow of the job.

SECRET